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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/773,815	01/31/2001	William T. Carpenter	P01426US2	8585
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FULBRIGHT & JAWORSKI, LLP 1301 MCKINNEY SUITE 5100 HOUSTON, TX 77010-3095			EXAMINER KRECK, JOHN J	
			ART UNIT 3673	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/773,815

Applicant(s)

CARPENTER, WILLIAM T.

Examiner

John Kreck

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Applicants reply to the requirement for information has been considered.

Claim Objections

Claim 13 is objected to because of the following informalities: claim 13 lacks the word "substance" as found in the prior claim listings. Appropriate correction is required.

Claim Rejections - 35 USC § 101 and 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

1. Claims 11-20 are rejected under 35 U.S.C. 101 because the claimed invention lacks patentable utility.

Claim 11 (as currently amended) is drawn to "[a] method of modifying the orientation of the axis of rotation of a planet". Applicant discloses (specification, page 5, line 26) that the change would affect "*the Earth's climatic pattern due to the change in angle of incidence to the Sun.*" Applicant has not disclosed any further effects of

modifying the axis of rotation. In response to the requirement for information, applicant stated: *"The utility of the invention is modification of the axis of rotation of a planet, Specification, p.4, Ins. 20-26, thereby affecting the planet's climatic pattern, Id., p. 5, Ins. 24-26. The desired affect is reasonably determined by one of ordinary skill in the art without undue experimentation."*

A "specific utility" is specific to the subject matter claimed and can "provide a well-defined and particular benefit to the public." In re Fisher, 421 F.3d 1365, 1371, 76 USPQ2d 1225, 1230 (Fed. Cir. 2005). This disclosed effect (altering the Earth's climate pattern) does not constitute a specific utility, since it does not provide a well-defined and particular benefit to the public; therefore the claimed invention fails to meet the requirements of 35 U.S.C. 101, for the reasons set forth below:

As applicant has disclosed; such modification would alter the angle of incidence of the sun to the earth, depending on the magnitude and direction of the modification. It is not disputed that the angle of sunlight reaching a location on the Earth's surface is dependent on the relative latitude of the location. This is due to the fact that the axis of the Earth is tilted relative to the solar system in inertial space. This tilt also provides for the variation in length of daylight hours in each location, depending on latitude and season. Modifying the orientation of the axis of rotation relative to the Earth's crust would therefore change the length of daylight and the angle of the sun's rays for each location on Earth, depending on the magnitude and direction of such modification relative to the celestial poles. It should be readily apparent that there is an infinite

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number of possible modifications, and it is noteworthy that applicant has not provided a single example.

Consider a hypothetical case of modifying the orientation of the axis in such a manner that it would appear that the geographic North Pole moves southwards in a direction opposite to the prime meridian. This would result in an apparent move of the city of London towards the rotational axis which corresponds to the celestial North Pole. London would therefore receive less hours of sunlight in Winter, and more in Summer—depending on the magnitude of the modification. London would also experience a change in the angle of the sun's rays: if London were to move towards the apparent or celestial North Pole, it would receive sunlight at a shallower angle, getting less energy and heat from the sun. Looking at a globe, one would see that this move would simultaneously move Eastern Siberia away from the rotational pole; in the opposite direction of London, since Siberia is located near the opposite meridian. That portion of Siberia would therefore receive more direct solar energy, but would also receive more hours of daylight in winter, and less in summer. Such a change would also affect the hours of light and angle of incidence of the sun on every spot on the globe: some would be moved closer to the equator, resulting in an increase of direct solar energy; while others would be moved towards the poles, resulting in a decrease in direct solar energy. Not only would some spots receive more or less solar energy, but the magnitude of change would be different for every spot on the globe: locations along the prime meridian and 180° would experience the greatest change, and other locations would experience differing amounts of change, depending on their latitude and longitude. How

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can one of ordinary skill in the art know what change in the orientation of the Earth's axis---"affecting the planet's climatic pattern" would result in a benefit to the public? Applicant provides no guidance on how to determine a climate pattern which would result from such a change, nor does applicant provide any guidance on how to determine whether a particular climate pattern would be beneficial.

Climate is notoriously difficult to model and predict: see, for example, "A Model Approach to Climate Change"---(2007), in particular see page 3, third paragraph, second sentence: *"The spacing between these points dictates the resolution of the model, which is currently limited by available computing power to about 200 km in the horizontal direction..."* This provides evidence that the current state (i.e. in 2007) of climate modeling is rough at best----the resolution of the Earth model is only one factor which affects the computations. See also "Computer Modelers Stimulate Real and Potential Climate, Work toward Prediction"---(December 1996), in particular, page 1, fourth paragraph , last sentence: *So, even though the weather can be forecast for a week without considering oceanic circulation, climate on time scales longer than a month must include the ocean.*" And the ultimate sentence: *"With the rapid advance of computer technology and our understanding of ocean physics, oceanic forecasting will eventually become a reality—perhaps early in the 21st century, marine and climate forecasting will become routine."* See also "Alarm at new climate warning"—2005, particularly, *"So no two simulations will produce exactly the same results. Overall the project produces a picture of the possible range of outcomes given the present state of scientific knowledge."* Also noted is "The Gap between Simulation and Understanding in

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Climate Modeling” which discuss the difficulties and inaccuracies inherent with climate modeling. These references provide evidence of the level of knowledge of one of ordinary skill in the art of climate modeling. It is clear that the level of knowledge is advancing, but today, and at the time of invention, the level of knowledge of one of ordinary skill in the art was not sufficient to enable one to determine a climate pattern which would result from a change in the orientation of the Earth’s axis, nor how to determine whether a particular climate pattern would be beneficial. Therefore, since the disclosure lacks any specific examples of use which would provide a well defined and particular benefit to the public, and since one of ordinary skill in the art would not be able to determine a well defined and particular benefit to the public; the claimed invention lacks patentable utility. A “specific utility” is specific to the subject matter claimed and can “provide a well-defined and particular benefit to the public.” In re Fisher, 421 F.3d 1365, 1371, 76 USPQ2d 1225, 1230 (Fed. Cir. 2005).

Concurrently, claims 11-20 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

2. Claims 11-20 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for “calculating a moment of stability required to cause the desired orientation of the axis of rotation” and “determining a position and mass” with respect to the crust of the planet, does not reasonably provide enablement

for such calculating and determining with respect to modifying the axis of rotation relative to inertial space. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims.

In the requirement for information dated 1/30/07 the following question was posed to applicant: Q1: Does the "orientation of the axis" refer to (a) the orientation of the axis of the planet relative to inertial space; or (b) orientation of the axis with respect to the crust of the planet? In the reply to the requirement for information dated 3/28/07, applicant stated that "*The "orientation of the axis of rotation of a planet" refers to any axis orientation that a user of the method might desire. Specification, p.4, Ins. 25-28.*"

It is noteworthy that applicant has not provided any equations or examples of calculations which would enable one of ordinary skill in the art to practice the claimed method steps of "calculating a moment of stability required to cause the desired orientation of the axis of rotation" and "determining a position and a mass of compensating substance sufficient to effect the moment of stability". It has previously been determined (BPAI decision dated 4/21/06—page 6) that one of ordinary skill in the art would be able to make those calculations and determinations with respect to "a desired character of rotation". This determination was made with the evidence provided by Chao, White, and Brown. It is clear that the Earth's axis may be altered relative to its crust, but there is no indication that the Earth's axis can be altered relative to inertial space. None of these references describe changing the orientation of the axis of rotation relative to inertial space. The previously cited article "geodesy" indicates that

the orientation of the axis relative to inertial space is affected by gravitational torques applied to the equatorial bulge of the Earth. Applicant has provided no evidence, examples, or calculations as to how to alter the gravitational torque. The Chao, White and Brown references make no mention of altering gravitational torque, nor do they make any mention of changes in the orientation of the axis relative to inertial space. In conclusion, one skilled in the art would not know how to practice the claimed invention; insofar as the invention relates to the orientation of the axis in inertial space.

3. Claims 11-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claims require "selecting a desired orientation of the axis of rotation". Applicant has asserted that the result from altering the axis of rotation is a change in the Earth's climate. It is therefore apparent that the "desired orientation of the axis of rotation" is one that would result in a desired climate. Applicant has not provided any examples of a desired change in the axis of rotation. How would one of ordinary skill in the art determine a desired change in the axis of rotation? As shown by the reference cited above, climate modeling is notoriously difficult, involving iterative calculations based on a set of assumptions and inputs. It is the position of the examiner that one of ordinary skill in the art would not know how to determine whether a particular orientation of the axis would result in a beneficial climate; and applicant has plainly failed to provide

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any example of a desired axis of rotation. Assuming, arguendo, that one of ordinary skill in the art would be able to properly calculate the climate effects from a given change in the axis of rotation, this would not enable one to perform the method step of "selecting a desired orientation of the axis of rotation"; since one would have first select a desired climate, and then model the orientation of the axis which would achieve that climate. Reverse modeling is more difficult than the climate modeling described in the references cited above, if not impossible.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chao "Excitation of the Earth's Polar Motion due to Mass Variations in Major Hydrological Reservoirs" (referred to as Chao "Excitation"). Chao "Excitation" discloses a method of determining how the axis of rotation of a planet is modified by the movement of a mass (water) to a predetermined position (hydrological reservoirs), including measuring the mass of a planet (M), determining the center of mass of a planet and characterizing the axis of rotation of the planet (J2, page 13,811 col. 2, line

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37 and page 13,814 col. 1, line 60 - col. 2, line 7), positioning the mass of water in the position (Table 2 which includes the mass/capacity of water and the position (latitude, longitude) of the positioned/artificial created water masses), calculating a moment of stability (page 13,811 col. 2, lines 24 to page 13, 812 col. 1, lines 12), and determining a position and a mass of compensating substance (page 13, 812 col. 1, lines 2-12) wherein two identical $\Delta m(t)$ situated on the same latitude but 180 degrees apart in longitude will cancel each other in the contributions to polar motion excitation function. With respect to the phrase a mass "sufficient to effect the moment of stability", Chao "Excitation" sets forth a Δm of larger than 10^{13} kg for the polar motion excitation function to change by more than 1 mas (page 13,812 col 2, lines 22-31), even though Chao "Excitation" suggest on page 13,811 col. 1, lines 12-29) that smaller mass movements, i.e., shipping of petroleum and goods or formations of polar sea ice, floating icebergs, may effect the polar motion. Chao "Excitation" does not explicitly disclose selecting a desired character of rotation and then positioning the mass at a determined position to effect the moment of stability of the earth. Chao "Excitation" teaches the effects of the character of rotation and moment of stability of the earth caused by masses of water (major artificial reservoirs) positioned around the earth and also teaches (page 13, 812 col. 1, lines 2-12) that a change in mass Δm located on longitudinal (λ) will push the excitation pole to the opposite longitudinal ($\lambda+180^\circ$), while a negative Δm will do the opposite, pulling the pole toward (λ): this directly corresponds to a change in the orientation of the axis of rotation. Therefore, Chao "Excitation" teaches one of ordinary skill in the art a method of selecting a desired character of

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rotation to counter the effects of the major artificial reservoirs, calculating a moment of stability required to cause this desired character of rotation (as set forth above), determining a position and a mass, i.e., an equal and opposite Δm for each of the major artificial reservoirs at a location 180° of longitude away from each of the major artificial reservoirs, and positioning the masses in the locations to counter the adverse effects of the major artificial reservoirs. It would have been obvious to one of ordinary skill in the art to extend the teachings of Chao "Excitation" to selecting a desired character of rotation, determining a position and a mass sufficient to effect the moment of stability and positioning the mass at a location to counter the change in character of the rotational axis due to the artificial reservoirs as taught by Chao "Excitation".

With respect to claims 12, 13, and 15-20, Chao "Excitation" discloses that masses of a compensating substance sufficient to effect the moment of stability are "hydrological reservoirs, including major natural lakes, artificial reservoirs (claim 13 above ground cavity), and a groundwater aquifer (claim 12 underground cavity)" (Page 13, 811 col. 1, lines 6-8).

With respect to claim 14, Chao "Excitation" discloses that the changing mass substance is solid, i.e., "polar and alpine glaciers" (Page 13,811 col. 2, lines 42,43).

Response to Arguments

Applicant's amendment to claim 11 has overcome the rejections based on Terraforming Venus: there is nothing the this reference to suggest altering the orientation of the axis.

With respect to applicant's arguments regarding the 112(1) non enabling rejection, applicant argues that prosecution may not be reopened or reconsidered on matters "already adjudicated" see 37 CFR 1.198, because "The Board has held that the claims are enabled" and "Thus, the 112 (1) rejection is procedurally improper and must be withdrawn". Contrary to applicant's arguments, the rejection under 35 USC 112(1) of August 18, 2006 is set forth under new matters that were not presented in the appeal of July 5, 2005, not considered by the Board of Appeals and therefore not "already adjudicated" by the Board. Further, looking to the Board of Appeals decision of April 21, 2006, the board summarized their position on page 5, lines 11-14, which states "In the case before us, after reviewing the disclosure as set forth in the specification, we are of the opinion that the examiner has not met his burden of advancing acceptable reasoning inconsistent with enablement." The Board goes on to explain on page 8, lines 26-30, that "The examiner has made no attempt to explain exactly why one of ordinary skill in the art would have been unable to calculate the relevant quantities and subsequently carry out the steps of the recited method via known engineering techniques". The Board did not hold the claims to be enabled. The Board has held that the examiner has failed to provide a prima facie case. In response to the amended claims, a further new rejection is made. Applicant's arguments regarding the merits of the previous 112(1) rejection are persuasive: Chao "Excitation" apparently teaches that the character of rotation of the planet is affected by repositioning masses, and that such effects can be calculated.

5. Applicant's arguments regarding the Storaasli and Hubert reference merit comment: In response to applicant's argument that they represent nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the references are pertinent to the problem of changing the rotation of a body spinning in space: clearly the same problem as addressed by applicant.

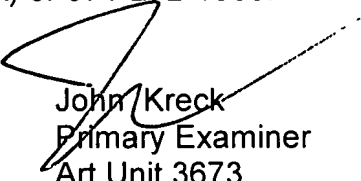
6. Applicant's brief arguments regarding Chao "Excitation" are not persuasive: applicant asserts that Chao fails to teach or suggest the steps of the claim. It is the examiner's position that the claimed steps are suggested or taught explicitly in Chao, as described above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Kreck whose telephone number is 571-272-7042. The examiner can normally be reached on Mon-Thurs 530am-2pm; Fri: telework.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patricia Engle can be reached on 571-272-6660. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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John Kreck
Primary Examiner
Art Unit 3673

11 July 2007